

## REMARKS

### I. Status of the claims

After entering this amendment, claims 1-9, 11, 12, 16, 26-29, 33-35, 45, 46, and 48-62 will be pending in this application. Claims 1-8, 26, 45, 52, and 59 have been amended in this response. Claim 1 has been amended to incorporate the limitations of claim 39, and consequently claim 39 has been cancelled. Claims 2-8 depended from claim 39 and consequently have been amended to depend now from claim 1. Claims 8, 26, 45, 52, and 59 have been amended to recite that the scratch resistance of the synthetic resin film of the invention is higher than the scratch resistance of a film that lacks the low profile additive but is otherwise identical to said synthetic resin film. Support for this amendment can be found, for example, in Table 1 of the specification, which shows the claimed relationship for each working example present therein. Claims 1, 11, 46, 53, and 60 have been amended to indicate that in the methods of the invention the impregnated substrate can be either further impregnated or coated with a second thermosetting composition. Support for this amendment can be found throughout the specification, for example, at p. 11, lines 1-3.

### II. Rejections under 35 U.S.C. § 103

The Office rejected the pending claims as unpatentable over U.S. patent no. 5,456,949 (*Albrinck*) in view of alleged admitted prior art and in further view of U.S. patent no. 5,928,778 (*Takahashi*) or U.S. patent no. 3,661,673 (*Merriam*) or *Microspheres: Microspheres Engineered for a Wide Choice of Unique Enhancements*

by 3M and Zeelan Industries, Inc. (3M pamphlet). Applicants respectfully traverse this rejection.

The Office argues that *Albrinck* discloses a method of producing a decorative laminate by impregnating a decorative alpha-cellulose paper with a coating formulation comprising melamine-formaldehyde resin with abrasion resistant particles. Office Action at p. 2. The Office further argues that *Albrinck* also discloses that “the resin impregnated decorative sheet is then further coated or saturated with an overcoat of a ‘neat’ melamine formaldehyde resin coating formulation which does not contain any abrasion resistant alumina particles or in the alternative contains abrasion resistant particles that are smaller than the particles used in the first coat.” *Id.* at p. 3. According to the Office, the damage resistant decorative laminate in *Albrinck* “may be produced either with or without an intermediate drying step between the initial coating and the subsequent overcoat.” *Id.* The Office admits, however, that the abrasion resistant particles in *Albrinck* are not disclosed as being substantially spherical.

The Office argues that *Merriam* and *Takahashi* each disclose that the use of spherical shaped particles provides improved abrasion resistance compared with particles in an indeterminate form made of the same material. Additionally, the Office argues that the 3M pamphlet teaches that “microspheres offer a variety of inherent advantages over many traditional irregularly shaped mineral fillers such as improved flow, lower resin demand, low viscosity/high filler loading, and reduced warpage and shrinkage.” *Id.* at p. 5. Therefore, in the Office’s view, it would have been obvious, based on the teachings of *Takahashi*, the 3M pamphlet, “and/or” *Merriam*, to utilize

spherical particles as opposed to other shaped particles in the invention taught by *Albrinck* to provide improved abrasion resistance.

## **II.A Impropriety of the combination of references**

### **There was no motivation to combine *Albrinck* with *Takahashi***

Applicants do not agree that *Albrinck* and *Takahashi* should be combined in the manner proposed by the Office. The Office seems to have chosen to consider selected and isolated passages from *Takahashi*, rather than to consider the reference in its entirety, as required by M.P.E.P. § 2141.02.

The Office cited *Takahashi* solely for its teaching that spherical particles improve abrasion resistance compared to amorphous particles and appears to have disregarded passages that actually teach away from the claimed invention.

*Takahashi* only discloses improved properties from the use of spherical particles when such particles are deposited on a *surface layer* rather than being part of a composition that *impregnates* a substrate. *Takahashi* at col. 9, lines 10-28. Therefore, *Takahashi* teaches away from impregnating a substrate with a resin comprising a low profile additive, as done in the impregnating step of *Albrinck* (see below). Indeed, *Takahashi* instructs the skilled artisan to avoid penetration by using a special coating method in the event the substrate is made of a material into which the coating composition would otherwise penetrate. *Id.* specially at col. 9, lines 23-26. In fact, it is critical in *Takahashi* that the relationship between the thickness of the coating layer and the average particle diameter be “strictly controlled” by the formula:  $0.3t \leq d \leq 3.0t$ ; where “t” is the average thickness of the coating layer and “d” is the average diameter of the spherical particle. See *Takahashi* at abstract and col. 3, lines 50-57. The existence

of this critical relationship demonstrates that the composition comprising spherical particles must be on the surface and not be allowed to penetrate the substrate.

*Albrinck*, on the other hand, requires impregnation. See, e.g., *Albrinck* at col. 6, lines 14-20. Therefore, the skilled artisan would have no motivation to use the spherical particles of *Takahashi* in the *impregnating* composition of *Albrinck* because *Takahashi* discloses improvements only when the spherical particles are on a *surface-coating* composition. Moreover, the skilled artisan would have no expectation of success that the improved abrasion-resistant properties of the spherical particles would materialize when such spherical particles are in a composition that impregnates the substrate rather than just being deposited on its surface, as taught by *Takahashi*.

**There was no motivation to combine *Albrinck* with *Merriam***

As with *Takahashi*, Applicants do not agree that *Albrinck* and *Merriam* should be combined in the manner proposed by the Office. Like *Takahashi*, *Merriam* also discloses the use of spherical particles in a surface-coating composition, rather than in an impregnating composition.

In *Merriam*, “[t]he *resin impregnant* when employed for saturating the base sheet conventionally comprises a liquid polyester *devoid of any solid filler*. The coating resin employed for forming the water-resistant surface coating comprises the same polyester resin incorporating therein a controlled amount of substantially spherical, solid transparent glass beads.” *Merriam* at col. 3, lines 57-64 (emphasis added).

A review of Figure 1 of *Merriam* and the accompanying text in the specification yields the same conclusion. For example, *Merriam* discloses that “after saturation with the impregnating resin, two saturated plies defining a base sheet...emerge from the

impregnating tank.” *Merriam* at col. 2, lines 24-26. This impregnating resin contains no solid filler. See also Figure 2. It is not until later in the process that a “*coating mixture* consisting of a resin incorporating a controlled quantity of substantially spherically shaped glass beads...is applied to the *surface* of the base sheet.” *Merriam* at col. 2, lines 29-34 (emphasis added).

Therefore, just like *Takahashi*, *Merriam* only teaches using spherical particles in a surface-coating composition and the skilled artisan would not be motivated to use the spherical particles of *Merriam* in the impregnating composition of *Albrinck* absent some suggestion to do so. No such suggestion is found in any of the references cited by the Office. For the same reasons discussed above for *Takahashi*, the skilled artisan would have no motivation to combine *Merriam* with *Albrinck* and consequently, no expectation of success in arriving at the claimed invention.

In light of the foregoing remarks Applicants respectfully request that this rejection be withdrawn.

**There was no motivation to combine *Albrinck* with the 3M pamphlet**

The 3M pamphlet was only cited for its disclosure of ceramic microspheres and its advantages over irregularly shaped mineral fillers and does not cure the deficiencies of *Takahashi* or *Merriam*. The 3M pamphlet suggests using ceramic microspheres in high solids industrial coatings. 3M pamphlet at p. 15 (facsimile-numbered page; other applications disclosed in the 3M pamphlet do not reference ceramic microspheres.) These high solids industrial coatings are not disclosed for use in decorative laminates, but are instead disclosed for use in applications such as automotive paint. *Id.* For at least this reason, the skilled artisan would have had no motivation to combine the

microspheres from the 3M pamphlet with the disclosure in *Albrinck* and Applicants respectfully request that this rejection be withdrawn.

## **II.B Discussion of individual claims**

### **Claims 1-9, 11, 12, 16, 27-29, and 33-35**

Even assuming, *arguendo*, that the skilled in the art would have combined *Takahashi*, *Merriam*, and/or the 3M pamphlet with the base reference *Albrinck*, the combination would not render, *inter alia*, claims 1-9, 11, 12, 16, 27-29, and 33-35 obvious.

Instant claims 1-9, 11, 12, 16, 27-29, and 33-35 recite that the particle size of the low profile additive in the resin composition be in the range of about 5 to about 60 microns. This limitation applies in both steps (a) and (c) in the claimed method of producing a synthetic resin film. *Albrinck*, on the other hand, requires that the second coating composition have "smaller abrasion resistant particles than the first coat" (abstract) and that the particle size in this second coating composition be of about 3 microns. *Albrinck* at col. 6, lines 14-20. This particle size is outside the range recited by claims 1-9, 11, 12, 16, 27-29, and 33-35, and does not suggest the instantly claimed range.

Given that *Albrinck* already discloses a successful abrasion resistant laminate, the skilled artisan would have no motivation to vary the size of the particles in the second coating composition, especially in light of the explicit indication in *Albrinck* to use smaller particles in that composition. Therefore, setting aside the impropriety of the combination, even if all the references cited by the Office were to be combined,

claims 1-9, 11, 12, 16, 27-29, and 33-35 still would not be obvious and Applicants respectfully request that this rejection be withdrawn.

**Claims 26, 45, 46, 52, and 59**

Even assuming, *arguendo*, that the skilled in the art would have combined *Takahashi*, *Merriam*, and/or the 3M pamphlet with the base reference *Albrinck*, the combination would not render, *inter alia*, claims 26, 45, 46, 52, and 59 obvious.

Claims 26, 45, 46, 52, and 59 recite the presence of ceramic microspheres in amounts sufficient to provide the resin film with a scratch resistance of about 2.5 Newtons or higher, wherein the scratch resistance of the resin film is higher than the scratch resistance of a film that lacks the uncoated ceramic microspheres but is otherwise identical to said resin film. Even if the references were combined to improve abrasion resistance, there is no indication in the cited art that the combination would also improve scratch resistance. Abrasion resistance and scratch resistance are different properties, and particles that provide abrasion resistance may not have a significant impact on scratch resistance. See Table A of the declaration filed on November 6, 2000 (First Liu Declaration) (showing the effect of the addition of alumina on the scratch resistance of a resin film). The results in Table A show that scratch resistance was unchanged, or even worse, in resin films to which alumina particles had been added compared to resin films not having such alumina particles. This result is consistent with experiments disclosed in *Albrinck*. For example, Table II in *Albrinck* shows that a laminate according to *Albrinck's* invention reduced the depth of the groove in an abrasion resistance test to almost half the value of that of a comparison laminate. The scratch resistance, however, was not improved. *Albrinck* at Table II, col. 9. In fact,

it appears that in *Albrinck's* Table II the sample of the invention (1) had *worse* scratch resistance than comparative sample (3). *Therefore, the skilled artisan would have had no expectation that combining the references cited by the Office would have produced the improved scratch resistance recited in the claims.* Indeed, Applicants report that the improvement in scratch resistance using the low profile additives of the invention was surprising and unexpected. Specification at p. 6, lines 7-9. Therefore, for at least this reason, Applicants respectfully request that this rejection be withdrawn.

#### **Claims 48-54**

Even assuming, *arguendo*, that the skilled in the art would have combined *Takahashi*, *Merriam*, and/or the 3M pamphlet with the base reference *Albrinck*, the combination would not render, *inter alia*, claims 48-54 obvious.

Instant claims 48-54 recite that the ceramic microspheres comprise about 0.5 to about 4.75% (wt) of the thermosetting resin after drying the impregnated substrate. As explained in the First Liu Declaration and its accompanying amendment, both filed on November 8, 2000, these values are supported by the data in Table 1 of the specification. Table 1 indicates a range of 0.71 to 6.8 g/m<sup>2</sup> of additive in the compositions of the working examples of the invention. In contrast, *Albrinck* requires that the amount of particles be from about 8 to 12 g/ m<sup>2</sup>. *Albrinck* at col. 5, lines 6-8. This range is outside of the range claimed in claims 48-54 and does not suggest the instantly claimed range.

It should be noted that even *Takahashi* requires a minimum of 5% (wt) spherical particles in its surface-coating composition, and preferably from 10 to 40%. *Takahashi* at col. 3, lines 30-36. *Merriam* requires an even higher amount of spherical particles, at



least 20% by weight. *Merriam* at col. 3, line 70 to col. 4, line 4. The skilled artisan would not be motivated to use ceramic microspheres in the amounts recited by instant claims 48-54, especially in light of the explicit indications to use higher amounts from the references cited by the Office. Therefore, setting aside the impropriety of the combination, even if all the references cited by the Office were to be combined, claims 48-54 still would not be obvious and Applicants respectfully request that this rejection be withdrawn.

#### **Claims 55-62**

As mentioned previously, the skilled artisan would have had no motivation to combine the teachings in *Albrinck* with *Takahashi*, *Merriam*, and/or the 3M pamphlet to arrive at the claimed invention. The person skilled in the art would not have been motivated to combine the teachings of *Takahashi* or *Merriam*, which relate to surface-coating a substrate with certain additives, with the teachings of *Albrinck*, which relate to impregnating a substrate with other additives. As mentioned above, the 3M pamphlet suggests using ceramic microspheres in high solids industrial coatings. 3M pamphlet at p. 15 These high solids industrial coatings are not disclosed for use in decorative laminates, but are instead disclosed for use in applications such as automotive paint. *Id.* For at least this reason, the skilled artisan would have had no motivation to combine the microspheres from the 3M pamphlet with the disclosure in the cited references and Applicants respectfully request that this rejection be withdrawn.

**III. Conclusions**


In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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